

Photographs of the Spectra of twenty-three characteristic Helium Stars; also Photographs of the Spectra of six Stars of the Third Magnitude, showing the transitions from type to type.
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The photographs shown represent a series of spectra of twenty-three stars, characterised by lines associated with the new element, helium. They have been taken during the last twelve months in the course of photographing the spectra of the northern stars down to the third magnitude. The group thus selected corresponds almost exactly with Class I. *a* of Lockyer's "Classification of Stellar Spectra" (*Phil. Trans.* December 1892). Helium was not then in question, but soon after its discovery Lockyer further attributed the characteristic spectrum of this class to that element (*Proc. Roy. Soc.* May 9, 1895).

The larger series of spectra mentioned will include about 160 stars. Photographs are shown of the spectra of six stars of the third magnitude, illustrating the transitions from type to type. The types are the original ones of Secchi, but Type I. is subdivided into five sections, including that of helium.

A scale of wave-lengths has been constructed by the usual method which will be sufficient to identify the lines. Dunér's Bands are indicated on the spectrum of α Herculis.

The instrument used is a photographic telescope made by Sir Howard Grubb. The object glass is of 12 inches aperture and 11 feet 3 inches focal length; a prism of the same aperture, with a refracting angle of 20° , is mounted in a hinged frame in front of the object glass; the cell of the prism also rotates in the plane of the frame; by this means the adjustment of the prism both in position and either on or off the object glass is effected with facility. The telescope was completed in 1895 May.

1896 May 8.

Note.—A copy of the photographs will be deposited in the Library. They include the following stars:

Helium Stars.

1. Orion β	Mag. 1	13. Perseus δ	Mag. 3
2. " γ	" 2	14. " ϵ	" 3
3. " δ	" 2	15. " ζ	" 3
4. " ϵ	" 2	16. Lyra β	" 3
5. " ζ	" 2	17. Pegasus γ	" 3
6. " ι	" 3	18. Ursa Minor η	" 2
7. " κ	" 3	19. Virgo α	" 1
8. Auriga β	" 2	20. Scorpio β	" 2
9. Taurus β	" 2	21. " δ	" 2
10. " ζ	" 3	22. " π	" 3
11. " η	" 3	23. " σ	" 3
12. Cassiopeia ϵ	" 3		

Typical Stars.

Type	I. Canis Minor β	...	...	...	Mag. 3
,,	I. Leo θ	...	...	...	,, 3
,,	I. ,, δ	...	...	...	,, 3
,,	I. ,, ζ	...	...	...	,, 3
,,	II. ,, ϵ	...	...	...	,, 3
,,	III. Hercules α...	...	...	...	,, 3

Diameters of Jupiter measured with the Filar and Double-image Micrometers at the Royal Observatory, Greenwich.

(Communicated by the Astronomer Royal.)

In 1895 June the results of the measures of *Jupiter's* diameters, made with a bi-filar micrometer attached to the 28-inch refractor, were communicated to the Society. At that time it was intimated that a few measures had also been made with the double-image micrometer, but that the results could not then be given, as the value of the micrometer-screw had not been ascertained. The observations have been continued, and the following are the results.

The method adopted was first to obtain a set of measures with the filar micrometer, and then a set with the double-image micrometer on the same evening. The 28-inch is well adapted for this, as the breech end is arranged for either direct or diagonal view by means of a plane mirror, which can be readily inserted or withdrawn. The bi-filar micrometer was mounted for direct view, and the double-image for diagonal view, by use of the plane mirror.

The adopted value of 1 rev. of the double-image micrometer is $4''\cdot151$, as ascertained by transits of a polar star on 1895 August 9.

The observations were made by Mr. Dyson and Mr. Lewis, and the results have been kept separate. Both observers made a few measures with a blue shade over the eye-piece, which made measuring easier.

The observations have all been reduced to mean distance $5\cdot2028$, and the correction for phase has been taken from Mr. Marth's Ephemeris in the *Monthly Notices*.